

**WE CLAIM:**

1. A method of creating a predecessor logical disk that is a snapshot of a successor logical disk, wherein the successor logical disk is defined by user data stored in a plurality of uniquely identifiable PSEGS and by metadata including an L2MAP having a plurality of LMAP pointers, one or more LMAPs including a plurality of RSD pointers, and one or more RDSs having a plurality of PSEG pointers, comprising the steps of:
  - 10       creating a predecessor PLDMC;
  - creating an LMAP for the predecessor logical disk;
  - populating the LMAP for the predecessor logical disk with RSD pointers from the successor logical disk;
  - creating an L2MAP for the predecessor logical disk;
  - 15       populating the L2MAP for the predecessor logical disk with the LMAP pointers from the predecessor logical disk;
  - setting share bits in the LMAPs for the predecessor logical disk and the successor logical disk to indicate that the data is being shared; and
  - 20       setting share bits in the successor PLDMC to indicate that the data is being shared.
2. A method according to claim 1, wherein the step of populating the LMAP for the predecessor logical disk with RSD pointers from the successor logical disk comprises  
25       copying RSD pointers.
3. A method according to claim 1, wherein I/O operations to the successor logical disk are quiesced for a predetermined period of time.

4. A method according to claim 3, wherein the predetermined period of time corresponds to the time required to construct the predecessor logical disk.

5. A method according to claim 1, further comprising  
5 the steps of:

receiving a write operation directed to memory located  
in an identified segment(s) of the successor logical disk;  
in response to the write operation, copying the  
identified segment(s) to the predecessor logical disk; and  
10 executing the write operation in the successor logical  
disk.

6. A method according to claim 5, further comprising  
the step of:

clearing share bits in the LMAPs for the predecessor  
15 logical disk and the successor logical disk to indicate that  
the identified segments are no longer being shared; and  
clearing share bits in the successor PLDMC to indicate  
that identified segments are no longer being shared.

7. A computer-based information storage system,  
20 comprising:

a pool of physical storage space divided into a  
plurality of physically addressable memory locations;  
a logical disk structure for mapping virtual storage  
addresses within the logical disk to physically addressable  
25 memory locations, the logical disk structure including a  
plurality of logically addressable RStores and a plurality  
of logically addressable LMAPs, wherein the LMAPs includes a  
first memory location for indicating whether a memory

segment is shared with a successor logical disk and a second memory location for indicating whether a memory segment is shared with a predecessor logical disk.